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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/737,226	12/16/2003	Jack L. Covault	03AB230	6338

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EXAMINER	
PATEL, DHARTI HARIDAS	

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/737,226	COVAULT, JACK L.	
	Examiner	Art Unit	
	Dharti H. Patel	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13-20 and 22-24* is/are rejected.

7)☒ Claim(s) *12 and 21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/16/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-11, 13-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al., Patent No. 6,621,259, in view of Covi et al., Patent No. 6,515,840.

With respect to claim 1, Jones teaches a method [Fig. 1, 1] for controlling application of electric power from a power source [Fig. 1, 14, Col. 4, lines 10-11] to a load [Fig. 1, 15, R_L, Col. 4, lines 17-20], the method comprising detecting a magnitude of electric current flowing to the load and producing a first signal level that indicates the magnitude of electric current [Col. 4, lines 28-31]; a comparing first signal level [Fig. 1, Vout] to a reference signal level [Col. 3, lines 51-52] which comparison produces an output signal [Fig. 1, DIGITAL OUT]. However, Jones does not disclose altering one of the first signal level and the reference signal level in response to variation of voltage applied to the load, which results in the output signal indicating when electric power consumed by the load exceeds a threshold level; and controlling flow of electric current from the power source to the load in response to the output signal.

Covi teaches a method [Fig. 1] for controlling application of electric power from a power source [Fig. 1, Voltage Bus] to a load [Fig. 1, 12]. Covi teaches altering one of the first signal level [Fig. 1, - terminal of operation amplifier 20] and the reference signal level [Fig. 1, V1ref] in response to variation of voltage applied to the load [Fig. 1, 12], which results in the output signal [Fig. 1, output signal coming from the output of operational amplifier 20] indicating when electric power consumed by the load exceeds a threshold level [Col. 1, lines 65-67, Col. 2, lines 1-8]; and controlling flow of electric current from the power source [Fig. 1, 14] to the load [Fig. 1, 12] in response to the output signal [Col. 3, lines 1-14].

Both teachings are analogous current sensing amplifiers for measuring current flowing through a sense resistor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Covi, with the circuit of Jones, for the benefit of causing the current controller to limit the magnitude of current flowing through the voltage bus when the differential amplifier senses an increase in current flowing through the voltage bus during an overcurrent condition.

With respect to claim 2, Jones teaches that the first signal level [Fig. 1, Vout] and the reference signal level [Fig. 1, Vref, Col. 3, lines 51-52] are voltage levels.

With respect to claim 3, Jones teaches that detecting a magnitude of electric current comprises providing current sensing resistor [Fig. 1, 12, Abstract, line 2, Col. 4, lines 12-14] through which electric current flows from the power

source [Fig. 1, 14] to the load [Fig. 1, 15], wherein voltage across the current sensing resistor [Fig. 1, 12] indicates a the magnitude of that electric current [Col. 4, lines 28-31]; connecting a first input of an operational amplifier [Fig. 1, 18] to a first side [Fig. 1, 11] of the current sensing resistor [Fig. 1, 12]; and connecting a second input of the operational amplifier [Fig. 1, 18] to a second side [Fig. 1, 13] of the current sensing resistor [Fig. 1, 12][Abstract, lines 1-4, Col. 4, lines 41-43].

With respect to claim 4, Jones teaches that the altering comprises detecting a load voltage applied to the load to produce a second signal level that indicates the load voltage [Fig. 1, Vout]; and combining the second signal level with the one of the first signal level and the reference signal level [Fig. 1, Vref, Col. 3, lines 51-52].

With respect to claim 5, Covi teaches that the altering comprises producing a second signal level corresponding to an amount that the load voltage exceeds a defined threshold; and combining the second signal level with the one of the first signal level and the reference signal level [Col. 3, lines 1-14].

With respect to claim 6, Covi teaches that controlling flow of electric current comprises disconnecting the load from the power source [Col. 3, lines 6-14].

With respect to claim 7, Jones teaches an apparatus [Fig. 1, 1] for controlling application of electric power from a power source [Fig. 1, 14, Col. 4, lines 10-11] to a load [Fig. 1, 15, R_L, Col. 4, lines 17-20], that apparatus

comprising a current sensing circuit [Fig. 1, 12, Rsense, 10] that detects a magnitude of electric current flowing to the load and producing a first signal level that indicates the magnitude of current [Col. 4, lines 28-31]. However, Jones does not disclose a comparator, a circuit branch, and a device.

Covi teaches a method [Fig. 1] for controlling application of electric power from a power source [Fig. 1, Voltage Bus] to a load [Fig. 1, 12]. Covi teaches a comparator [Fig. 1, 20] connected to the current sensing circuit [Fig. 1, Rs] and having a first input to which the first signal level [Fig. 1, - input of comparator 20] is applied, a second input connected to a source of a reference signal level [Fig. 1, + input of comparator 20 is Vref], and a comparator output [Fig. 1, output of comparator 20] at which an output signal is produced in response to comparing the first signal level and the reference signal level; a circuit branch [Fig. 1, 22] connected to the comparator and which alters one of the first signal level and the reference signal level in response to variation of voltage applied to the load, wherein results in the output signal indicating when electric power consumed by the load exceeds a threshold level [Col. 3, lines 6-14]; and a device [Fig. 1, MOSFET Q1] connected to the comparator output and controlling flow of electric current from the power source to the load in response to the output signal [Col. 3, lines 1-14].

With respect to claim 8, Covi teaches that the first signal level [Fig. 1, - input] and the reference signal level [Fig. 1, V1ref] are voltage levels.

With respect to claim 9, Jones teaches that the current sensing circuit comprises a current sensing resistor [Fig. 1, 12, Abstract, line 2, Col. 4, lines 12-14], voltage across which indicates the magnitude of current flowing to the load [Col. 4, lines 28-31]; and an operational amplifier [Fig. 1, 18] having a first input [Fig. 1, (-) input of amplifier 18] connected to a first side [Fig. 1, 11] of the current sensing resistor [Fig. 1, 12], a second input [Fig. 1, (+) input of amplifier 18] connected to a second side [Fig. 1, 13] of the current sensing resistor [Fig. 1, 12][Col. 4, lines 65-67, Col. 5, lines 1-5], and producing the first signal level [Fig. 1, 22].

With respect to claim 10, Covi teaches that the circuit branch [Fig. 1, 22] comprises an impedance element [Fig. 1, 22 is a resistor, an impedance element] coupling the first input [Fig. 1, (-) input of comparator 20] of the comparator [Fig. 1, 20] to one of the first and second sides of the current sensing resistor [Fig. 1, Resistor 22 is connected to one of the side of a current sensing resistor Rs].

With respect to claim 11, Covi teaches that the circuit branch comprises a circuit element [Fig. 3, 28] connected to the current sensing resistor [Fig. 3, Rs] and producing a signal indicating when voltage applied to the load exceeds a defined magnitude [Col. 2, lines 59-67]; and a second operational amplifier [Fig. 3, 44] having an input [Fig. 3, (-) input of 44] coupled to the circuit element [Fig. 1, 28] and having a second output [Fig. 3, output of 44] connected to the second input [Fig. 1, (-) input of 20] of the comparator [Fig. 1, 20].

With respect to claim 13, Covi teaches that the device [Fig. 1, Q1] selectively disconnects the load from the power source in response to a signal at the comparator output [Col. 3, lines 6-14].

With respect to claim 14, Jones teaches an apparatus [Fig. 1, 1] for controlling application of electric power from a power source [Fig. 1, 14] to a load [Fig. 1, 15], that apparatus comprising a current sensing resistor [Fig. 1, 12, Rsense], voltage across which indicates a level of current flowing to the load [Fig. 1, 15]; an operational amplifier [Fig. 1, 18] having one input [Fig. 1, (-) input of amplifier 18] connected to a first side [Fig. 1, 11] of the current sensing resistor [Fig. 1, 12], another input [Fig. 1, (+) input of amplifier 18] connected to a second side [Fig. 1, 13] of the current sensing resistor [Fig. 1, 12], and having an output [Fig. 1, 22] at which an output voltage is produced which indicates the level of current flowing to the load; a comparator [Fig. 1, 44] having a first input [Fig. 1, (+) input of 44] coupled to the output of the operational amplifier [Fig. 1, 18], a second input [Fig. 1, (-) input of 44] connected to a source of a reference voltage [Col. 3, lines 51-52], and a comparator output [Fig. 1, output of 44]. However, Jones does not disclose a power limit resistor and a disconnect device.

Covi teaches a method [Fig. 1] for controlling application of electric power from a power source [Fig. 1, Voltage Bus] to a load [Fig. 1, 12]. Covi teaches a power limit resistor [Fig. 1, 22] connected between the one input [Fig. 1, (-) input of comparator 20] of the comparator and one of the first side and second side of the current sensing resistor [Fig. 1, resistor 22 is connected to at least one side

of current sensing resistor Rs]; and a disconnect device [Fig. 1, Q1] connected to the comparator output and selectively disconnecting the load from the power source in response to a signal at the comparator output [Col. 3, lines 6-14].

Both teachings are analogous current sensing amplifiers for measuring current flowing through a sense resistor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Covi, with the circuit of Jones, for the benefit of causing the current controller to limit the magnitude of current flowing through the voltage bus when the differential amplifier senses an increase in current flowing through the voltage bus during an overcurrent condition.

With respect to claim 15, Jones teaches that the apparatus further comprises a transistor [Fig. 1, 26] having a control electrode [Fig. 1, 22, gate electrode of transistor 26] connected to the output of the operational amplifier and a conduction path connecting the first input [Fig. 1, (-) input of op-amp 18] of the operational amplifier to the one input of the comparator [Fig. 1, Vout].

With respect to claim 16, Jones further comprises a bias resistor [Fig. 1, 40, Rout] coupling the one input [Fig. 1, (+) input of 44] of the comparator to ground.

With respect to claim 17, Jones teaches that the apparatus further comprises an input resistor [Fig. 1, 16] coupling the first input [Fig. 1, (+) input of

op-amp 18] of the operational amplifier [Fig. 1, 18] to the first side [Fig. 1, 13] of the current sensing resistor [Fig. 1,12].

With respect to claim 18, Jones teaches that the apparatus further comprises a transistor [Fig. 1, 26] having a control electrode [Fig. 1, gate electrode of transistor 26] connected to the output of the operational amplifier [Fig. 1, output of operational amplifier 18] and a conduction path connecting the first input [Fig. 1, (+) input of op-amp 18] of the operational amplifier to the one input of the comparator [Fig. 1, 36, Vout (+)]; an input resistor [Fig. 1, 19] coupling the first input [Fig. 1, (+) input of op-amp 18] of the operational amplifier [Fig. 1, 18] to the first side [Fig. 1, 13] of the current sensing resistor [Fig. 1, 12]; and a bias resistor [Fig. 1, 40] coupling the one input [Fig. 1, Vout +] of the comparator [Fig. 1, 44] to ground.

With respect to claim 19, Jones teaches an apparatus [Fig. 1, 1] for controlling application of electric power from a power source [Fig. 1, 14] to a load [Fig. 1, 15], that apparatus comprising an input terminal [Fig. 1, 13]; a current sensing resistor [Fig. 1, 12] connected between the input terminal [Fig. 1, 13] and the load [Fig. 1, 15], wherein voltage across the current sensing resistor indicates a level of current flowing to the load [Col. 4, lines 28-31]; a first operational amplifier [Fig. 1, 18] having a first input [Fig. 1, (+) input] connected to a first side [Fig. 1, 13] of the current sensing resistor [Fig. 1, 12], a second input [Fig. 1, (-) input] connected to a second side [Fig. 1, 11] of the current sensing resistor [Fig. 1, 12], and having a first output [Fig. 1, 22] at which an output voltage is

produced which indicates the level of current flowing to the load; a comparator [Fig. 1, 44] having a first comparator input [Fig. 1, Vout (+)] coupled to the first output [Fig. 1, 22] of the first operational amplifier [Fig. 1, 18]. However, Jones does not disclose a second comparator, a circuit element, a second operational amplifier, and a disconnect device.

Covi teaches a method [Fig. 1] for controlling application of electric power from a power source [Fig. 1, Voltage Bus] to a load [Fig. 3, 12]. Covi teaches a second comparator [Fig. 3, 44] input connected to a source of a reference voltage [Fig. 3, V2ref], and a comparator output [Fig .3, output of amplifier 44] at which an output signal is produced; a circuit element [Fig. 3, 28] connected to the current sensing resistor [Fig. 3, Rs] and producing a control signal indicating an amount that voltage applied to the load exceeds a defined magnitude [Col. 2, lines 59-67]; a second operational amplifier [Fig. 3, 44] having an input [Fig. 1, (-) input of 44] coupled to the circuit element [Fig. 1, 28] and having a second output [Fig. 1, output of 44] connected to the second input [Fig. 3, (-) input of 20] of the comparator [Fig. 3, 20], wherein the second operational amplifier alters voltage at the second input in response to the control signal so that the output signal of the comparator indicates when power consumed by the load exceeds a threshold level [Col. 2, lines 59-67]; and a disconnect device [Fig. 3, Q1] connected to the comparator output [Fig. 3, 44] and selectively disconnecting the load from the power source in response to a signal at the comparator output [Col. 3, lines 6-14].

Both teachings are analogous current sensing amplifiers for measuring current flowing through a sense resistor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Covi, with the circuit of Jones, for the benefit of causing the current controller to limit the magnitude of current flowing through the voltage bus when the differential amplifier senses an increase in current flowing through the voltage bus during an overcurrent condition.

With respect to claim 20, Jones teaches that the circuit element [Fig. 3, 28] comprises a Zener diode.

With respect to claim 22, Jones teaches that the apparatus further comprises a transistor [Fig. 1, 26] having a control electrode [Fig. 1, gate electrode of transistor 26] connected to the output [Fig. 1, 22] of the first operational amplifier [Fig. 1, 18], and having a conduction path that connects the first input [Fig. 1, (+) input of 18] of the first operational amplifier [Fig. 1, 18] to the first comparator input [Fig. 1, Vout (+)].

With respect to claim 23, Jones teaches that the apparatus further comprises a bias resistor [Fig. 1, 40] coupling the one input [Fig. 1, (-) input of 44] of the comparator [Fig. 1, 44] to circuit ground.

With respect to claim 24, Jones teaches that the apparatus further comprises an input resistor [Fig. 1, 19] coupling the first input [Fig. 1, (+) input op

op-amp 18] of the operational amplifier [Fig. 1, 18] to the first side [Fig .1, 13] of the current sensing resistor [Fig. 1, 12, Rsense].

Allowable Subject Matter

2. Claims 12 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for indicating allowance of claims 12 and 21: The prior art teaches a first resistor, a Zener diode connected in series with the first resistor between the current sensing resistor and circuit ground, but does not disclose a second resistor, a third resistor, and a fourth resistor connected in series coupling the sensing node to the second input of the comparator; and second operation amplifier having one input connected to a point between the second resistor and the third resistor, another input connected to the circuit ground, and an output connected to another point between the third resistor and the fourth resistor. This feature in combination with the rest of the claim limitations is not anticipated or rendered obvious by the prior art of record.

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dharti H. Patel whose telephone number is 571-272-8659. The examiner can normally be reached on 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800, Ext. 36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DHP
07/26/2006

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